NOVEMBER/DECEMBER 2023

CEL31 — PHYSICS OF MATERIALS

Time : Three hours Maximum : 75 marks

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SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. What is covalent bond?
2. Define primitive cell.
3. What are Miller indices?
4. State the feature of Bragg spectrometer.
5. Define density of state.
6. Define thermal conductivity.
7. What is doping?
8. What is electrical conductivity?
9. What do you mean by depletion region?
10. What is Hall effect?

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SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Write short note on molecular and hydrogen bonds.

Or

(b) Explain the Miller indices.

12. (a) Describe the working of Bragg spectrometer.

Or

(b) Discuss the powder method.

13. (a) Outline the density of states.

Or

(b) Brief the mean free path and relaxation time.

14. (a) Enumerate the extrinsic semiconductors.

Or

(b) Write a short note on electron and hole concentration in intrinsic semiconductor.

15. (a) Elucidate the drift velocity and mobility of charge carriers.

Or

(b) Outline the Hall voltage and Hall coefficient.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain the seven crystal systems.

17. Discuss the rotating crystal method.

18. Obtain the ratio between the electrical conductivity and thermal conductivity.

19. Explain the Fermi level in n type and p type semiconductor.

20. Describe the experimental determination of Hall coefficient.

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